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PENSOFT

Lamprochernes savignyi (Simon, 1881) (Arachnida, Pseudoscorpiones) recorded in Central Europe for the first time

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Abstract

The pseudoscorpion *Lamprochernes savignyi* (Simon, 1881) is reported in Central Europe for the first time. The new record from Switzerland is based on a single female specimen found in a compost heap in the Conservatory and Botanical Garden in Geneva. Until now, the species is distributed mainly in Africa, Americas, and Asia, less in Australia and Oceania, Europe, and the Arabian Peninsula. The new record fills in the gap in species distribution between Northern Europe and the Anatolian Peninsula. A description of the collected female is provided.

Key words

Botanical garden, distribution, faunistics, phoresy, Switzerland

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Introduction

The genus *Lamprochernes* Tömösváry, 1882 belongs to the subfamily Lamprochernetinae, as defined by Harvey (1994). Until recently, nine species of the genus have been discovered, five of them occur in Europe (Harvey 2013). *Lamprochernes leptaleus* (Navás, 1918) has been recorded only in Spain and *L. moreoticus* (Beier, 1929) only in Greece (Harvey 2013). The other three species are widely distributed, undoubtedly due to human introductions as well as their phoretic associations (Harvey 1987). *Lamprochernes chyzeri* (Tömösváry, 1883) and *L. nodosus* (Schrank, 1803) are distributed across Europe, *L. chyzeri* is known also from Turkey, Caucasus and Central Asia, and *L. nodosus* from Africa, Middle East, Caucasus, and Asia (Harvey 2013). Currently, *L. savignyi* (Simon, 1881) is known to be distributed mainly in Africa, Americas, and Asia, less in Australia and Oceania, Europe, and the Arabian Peninsula (Harvey 2013); however, its origin is uncertain. There are only a few records from Europe (Denmark, Ireland, Spain, and the United Kingdom) and no records at all from Central Europe (Harvey 2013). Harvey (1987) included all nymphal stages as well as adults of both sexes in his redescription of *L. savignyi*. Along with six new synonyms of *L. savignyi* and a new generic synonym of *Lamprochernes*, the species was revealed to be distributed worldwide and synanthropic (Harvey 1987). Herein, we present the first occurrence of this species in Central Europe and describe the female of *L. savignyi* from Switzerland.

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Methods

A single female of *L. savignyi* was collected in the Conservatory and Botanical Garden of the City of Geneva, Geneva, Switzerland (Fig. 1). The female was individually collected with forceps from an outdoor, 3-year-old compost heap of plant material. The specimen was preserved in 70% ethanol. It was studied as a temporary slide mount, which was prepared by immersing the specimen in lactic acid for clearing. After study, the specimen was rinsed in water and returned to ethanol. Morphological and morphometric analyses were performed using a Leica DM1000 compound microscope with an ICC50 Camera Module (LAS EZ application, 1.8.0). Measurements were taken from digital images using the AxioVision 40LE application. Digital photographs (Figs. 2, 3) were taken using a Canon EOS 5D Mark II camera attached to a Zeiss Axio Zoom V16 stereomicroscope. Image stacks were produced manually, combined using the Zerene Stacker software and subsequently edited in Adobe Photoshop CC. The pseudoscorpion was identified using the description by Harvey (1987). The nomenclature follows Harvey (2013). The material is deposited in the collections of the Basel Museum of Natural History, Switzerland.

Results

Chernetidae Menge, 1855
Lamprochernetinae Beier, 1932

***Lamprochernes savignyi* (Simon, 1881)**

New records. SWITZERLAND • 1 ♀; Conservatory and Botanical Garden of the City of Geneva, Geneva (Fig. 1); 46.2283°S, 006.1485°W, 378 m a.s.l.; 15 Oct. 2019; José D. Gilgado and Ian Bobbitt leg.; in outdoor compost heap; NMB-PSEU 118a.

Short description. Adult female (Figs. 2, 3). Setae on body long, pointed and finely toothed; body surface generally smooth, lateral margins of carapace and internal margins of pedipalpal trochanter, femur, tibia and chela moderately granulate. Pleural membrane longitudinally striate. **Carapace**: 1.40 × longer than broad; epistome absent, eyes or eyes spots absent; single, median transverse furrow present. Chaetotaxy of carapace: 80 setae, anterior disk with 41 setae and 12 lyrifissures, medial disk with 28 setae and two lyrifissures and posterior margin with 11 setae and six lyrifissures. **Coxae**: chaetotaxy of coxae: palpal coxae with 28–32 acuminate setae and one pair of median maxillary lyrifissures; pedal coxae I–IV

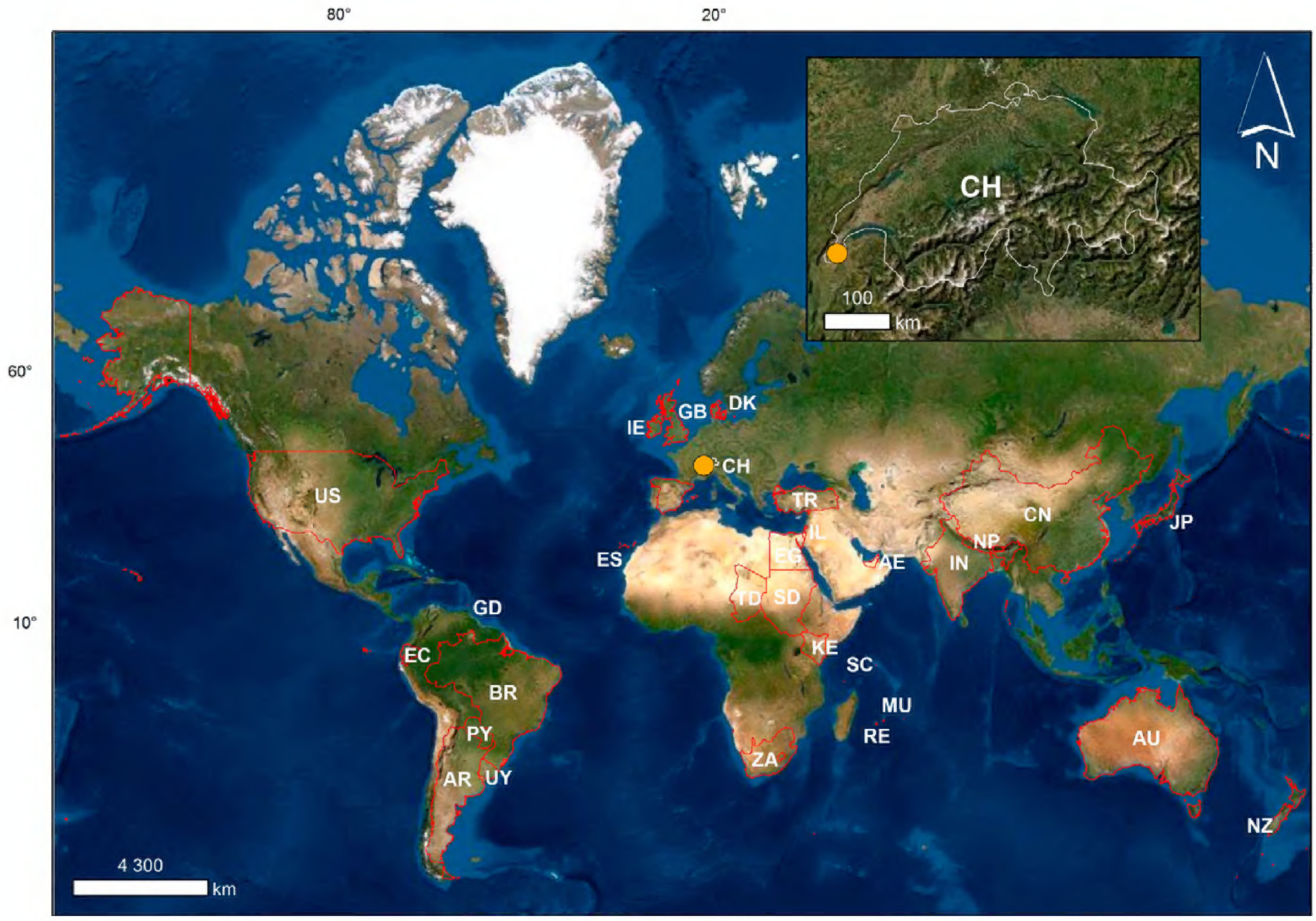

Figure 1. Distribution of *Lamprochernes savignyi* (red border = published distribution, orange circle = first record in Switzerland). Abbreviations: Argentina (AR), Australia (AU), Brazil (BR), Chad (TD), China (CN), Denmark (DK), Ecuador (EC), Egypt (EG), Grenada (GD), India (IN), Ireland (IE), Israel (IL), Japan (JP), Kenya (KE), Mauritius (MU), Nepal (NP), New Zealand (NZ), Paraguay (PY), Reunion (RE), Seychelles (SC), South Africa (ZA), Spain – Canary Islands (ES), Sudan (SD), Switzerland (CH), Turkey (TR), United Arab Emirates (AE), United Kingdom (GB), United States (US), Uruguay (UY).

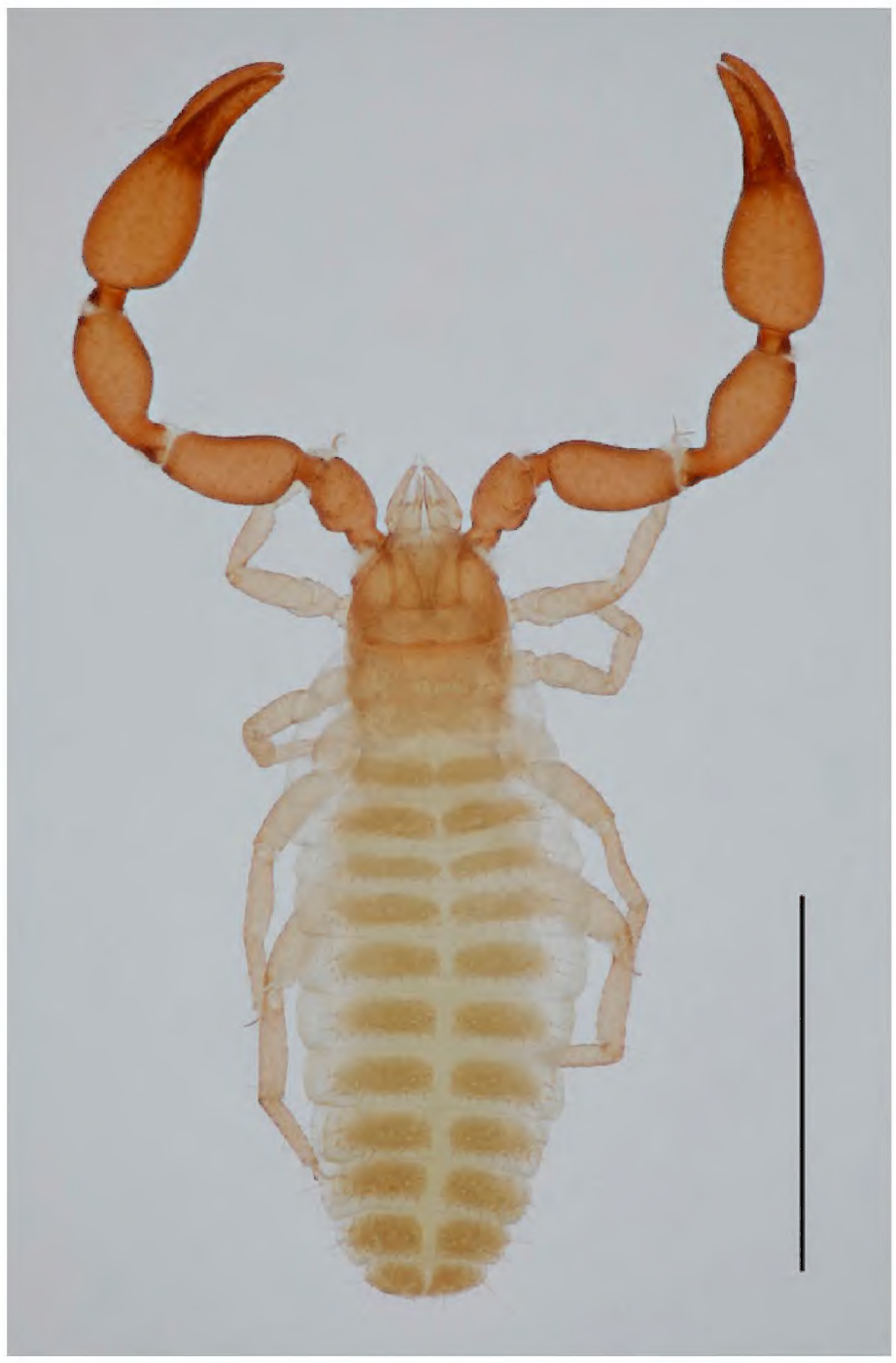

Figure 2. *Lamprochernes savignyi*. Female, dorsal view. Scale bar: 1 mm.

all with acuminate setae: I 13–15, II 15–17, III 18–19, IV 33–34. **Chelicerae**: 2.22 × longer than broad; small, slightly sclerotized; five setae (anomaly on the right chelicera, hand with six setae) and two lyrifissures on hand; moveable finger with slender well-developed galea, main stalk with five terminal rami; rallum consisting of three blades; serrula exterior with 17 blades; small, largely unsclerotized teeth situated on both moveable and fixed fingers. **Pedipalps**: trochanter with dorsal protuberance, 1.73 ×; femur abruptly pedicellate, 2.21 ×; patella 2.32 ×, hand (with pedicel) 1.74 ×, chela (with pedicel) 2.93 × longer than broad. Chelal fingers with 12 trichobothria (eight on fixed and four on moveable chelal finger); *it* closer to *ist* than to tip of fixed finger; *est* slightly distal to *ist*. Venom apparatus present in moveable finger terminating in nodus ramosus close to terminal trichobothrium. Fixed finger with 31 marginal teeth, four antiaxial accessory teeth and two paraxial accessory teeth; moveable finger with 36 marginal teeth, four antiaxial accessory teeth and one paraxial tooth. **Opisthosoma**: Tergal chaetotaxy (tergites divided, counted together): 18: 21: 20: 25: 26: 23: 25: 21: 23: 21: 10+2 long tactile setae. Tergal lyrifissures: 4: 2: 2: 4: 3: 4: 4: 4: 6: 0: 2. Sternal chaetotaxy: 0: 16: (3–4)6(3–4): (3–4)8(3–4): 22: 25: 28: 26: 26: 20: 6+4 long tactile setae. Sternal lyrifissures 0: 2: 1: 2: 2: 2: 2: 2: 2: 2: 0. Female genitalia with long, T-shaped spermatheca. **Leg I**: trochanter damaged, femur 1.25 ×, patella 2.09 ×, tibia 2.88, tarsus 4.33 × longer than deep. **Leg IV**: trochanter 1.62 ×, femoropatella 3.83 ×, tibia 3.78 ×, tarsus 4.83 × longer than deep. Leg IV with three tactile setae: one distally on femoropatella, one distally on tibia and one submedially on tarsus; claws simple.

Dimensions. (length/width or, in the case of the legs, length/depth in mm). Body length 2.08. Pedipalp: trochanter 0.26/0.15, femur 0.42/0.19, patella 0.44/0.19, chela with pedicel 0.79/0.27, hand with pedicel 0.47, hand without pedicel 0.41, moveable finger 0.38. Chelicera 0.20/0.09, moveable finger 0.16. Carapace 0.60/0.43. Leg I: trochanter damaged, femur 0.15/0.12, patella 0.23/0.11, tibia 0.23/0.08, tarsus 0.26/0.06. Leg IV: trochanter 0.21/0.13, femoropatella 0.46/0.12, tibia 0.34/0.09, tarsus 0.29/0.06, distance of tarsal tactile seta from proximal margin of the segment 0.12.

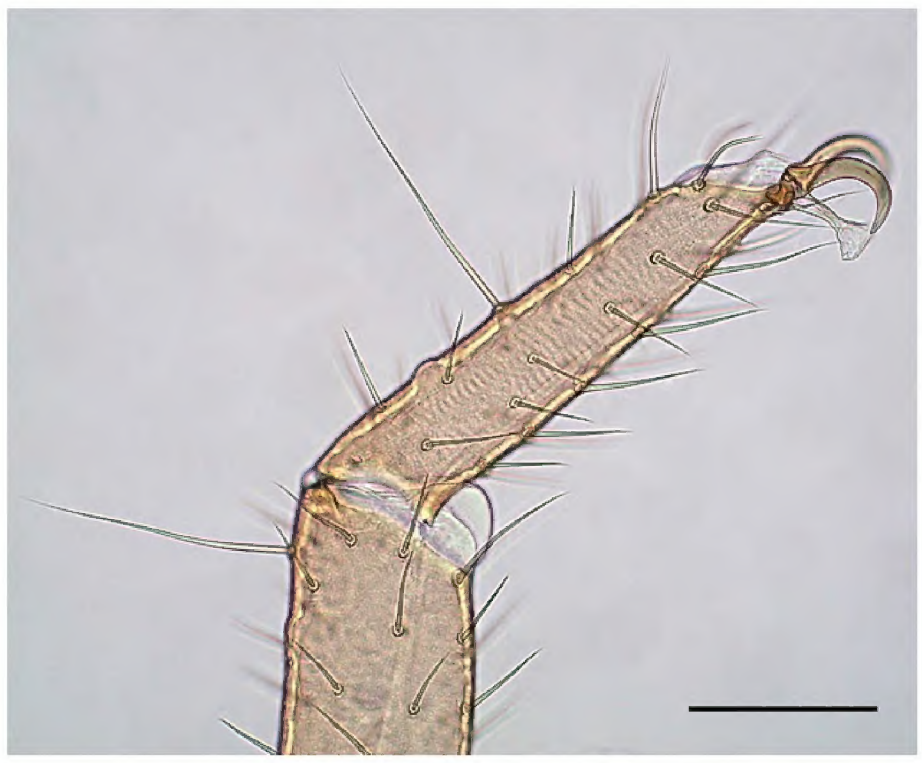

Figure 3. *Lamprochernes savignyi*. Tarsus of leg IV with the position of the tactile seta. Scale bar: 0.1 mm.

Identification. Species delineation in *Lamprochernes* pseudoscorpions is quite challenging, mainly because of the absence of detailed descriptions for many species, mistakes in the descriptions, synonymisations, or missing holotypes. These difficulties are more severe in the European *Lamprochernes* species. *Lamprochernes moreoticus* was described based on two adults and only few characters of the species were mentioned in the description by Beier (1929, 1932). *Lamprochernes savignyi* differs from the species by the position of tactile seta on tarsus IV (submedially in *L. savignyi*, in one-third from the base of the segment in *L. moreoticus*) and by palpal measurements (palpal femur 0.42, patella 0.44, hand 0.47 and finger 0.38 mm long in the female of *L. savignyi*; palpal femur 0.57, patella 0.55, hand 0.67 and finger 0.40 mm long in the female of *L. moreoticus*) (Beier 1929, 1932).

The situation with *L. leptaleus* is even more confusing. The poor description of *L. leptaleus*, which is based on a single specimen, raises doubts as to whether the species even belongs to the genus (Navás 1918).

From the last two known European species, *L. chyzeri* and *L. nodosus*, *L. savignyi* differs by the position of tarsal tactile setae on tarsus IV, which is situated distally than in these two species (Christophoryová et al. 2011). From *L. chyzeri* it differs also by the length of the palpal femur (0.37–0.46 mm in *L. savignyi*, 0.51–0.67 mm in *L. chyzeri*) (Harvey 1987; Christophoryová et al. 2011). The range of measurements of the palpal femur overlap considerably in *L. nodosus* (0.41–0.63 mm) and *L. savignyi* (Harvey 1987; Christophoryová et al. 2011).

Discussion

The main diagnostic characters of the Swiss female correspond with the description of the female by Harvey (1987). In the above description, some characters were added such as lyrifissures on tergites and sternites, chaetotaxy on palpal coxae, and the whole chaetotaxy of carapace.

Lamprochernes savignyi is widely distributed, undoubtedly due to human introductions as well as its phoretic associations (Harvey 1987). The phoresy of the species was recorded from many localities, mainly on Diptera hosts (e.g. Ellingsen 1907; Kew 1909, 1916; Beier 1953, 1958, 1963, 1964, 1969; Judson 1979). The native distribution of this species is difficult to ascertain, but many of the African specimens appear to have been collected far from human habitations (Harvey 1987). In Europe, the species has only been collected sporadically, with definitive collections in Denmark, Ireland, Spain, and the United Kingdom (Harvey 2013). In Denmark, the species was collected in compost heaps in gardens (Hansen 1884; Meinertz 1964). In Ireland and the United Kingdom, it was found in synanthropic conditions in houses, offices, and shops, where it was phoretic on flies (Ellingsen 1907; Kew 1909, 1911, 1916; Judson 1979), in compost or manure heaps, under a stone near a compost heap, and among moss (Kew 1911; Judson 1979; Jones 1985; Legg and Jones 1988). In Canary Islands, Spain, this species was sieved from compost heap in a garden (Mahnert 1997).

The new finding in Switzerland agrees with this species' known habitat preferences. The new locality represents the first record of the species in Central Europe and fills a distributional gap between Northern Europe and the Anatolian Peninsula (Turkey). In Turkey, the specimens were found in litter, dried dung hills, and straw (Sezek and Özkan 2006). The odds are that *L. savignyi* will be recorded in other European countries.

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Authors' Contributions

JDG and IB collected the specimen; JCH and KK identified the specimen; JCH wrote the manuscript; KK created the map in collaboration; KK, JDG and IB revised the text.

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